

HOME

THE AMERICAN SPECIALIST PUBLICATION

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Computing

WEEKLY

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Commodore

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First new Oric pics

Two new Oric games are being released this month. The first is a new Oric game called "The Oric Game" which is a new Oric game.

The second is a new Oric game called "The Oric Game" which is a new Oric game.

The third is a new Oric game called "The Oric Game" which is a new Oric game.



Games to type
in for: VIC-20,
Spectrum,
Sord M5,
ZX81

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to head the ball remorselessly to the goal. Oh the joy of GOAL!

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Software houses: send your software for review to the editorial office at the address below. Consider us for competitions and other promotions, too.

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to bring the sun
it to me and my
mother!

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New Oric

From front page

excellent graphic commands which can give 3D effects. One has really gone to town on the graphics."

Mr Ewins, formerly operations director at Imagine, explained how speed is also enhanced. "The Oric contains a 64 word chip, which was never used to the full. The new machine really uses the chip to its limit."

The Oric 164, as the machine is currently known, has black and red plastic casing. "It's a 6802 machine spruced from the Atom," said Mr Ewins. "There's room for two ROM cartridge, one of which will be the language, and one the application."

"One of these cartridges will hold BASIC and the other 48K, or 8192K, and there'll be 64K RAM on board. We're really giving the user quite a lot of memory."

"It has an 80320 kernel, a disc controller and a built-in modem driver," he went on. "There's also two joystick ports."

The machine will be supplied with SuperBASIC and one ROM cartridge. As for software, here in Tynes we have something very innovative and interesting at our store, but I'm not prepared to divulge any details until I don't want our

competitors to get in on the act."

Mr Ewins explained why Oric hasn't died the year for the Oric 164 yet. "It all depends on what happens with the dollar, and what happens to chip prices. If the agreed arrangements against the dollar and chip prices fall we will be able to bring the new competitor on at the price we want."

The Oric 164 will be launched first in Tynes, where Oric holds over 50 per cent of the market. It will be launched there in the Spring — a name already registered by another company in the UK.

"Our advertising agency screwed up on the name," said Mr Ewins. "The Atom was refused as the first in a family of names, but what the advertising agency forgot to check was whether the other names were registered here."

The words come from the Greek — atomos and anaphora, and And Oric is now rather stuck for a new name.

"If any of your readers have any suggestions, I'd be pleased to hear," he joked.

Oric, Conway Park, London Rd, Aired, Leeds LS1 2BB

Tynes, Unit 1 and 2, Tynes Park, Newcastle Rd, Cambridge

Popeye, the sailor man

Popeye, St Ives' first home and game, is now available, after 30 weeks of programming by a team of five.

The aim of the game is to build your "house over time", and you are cast in the role of Popeye — who sleep Bilcoo in your arch enemy, and you must make him while you gather up all your building materials from the building site.

Waggy helps you by taking you items back to the start. However, you have to pay the price of his services by leaving him supplied with hamburgers.

When it's over, you, and he want to throw you off the scaffolding into the sea. Olive Oyl comes to the rescue by stopping you with the real Spanish which makes a man out of a mouse.

Cost of the game, £3.95

St Ives, Unit 6, Shore Rd, Sea View, St Ives, Cornwall TR14 6JG

Prices slashed

Mastertron, who brought you set-price arcade games, is now launching budget-price software.

Master Adventure is the latest on which the low-cost adventure games will be released, and the game will cost £1.99 and £1.99.

So-Kiss of Angels is the first release on the latest Mastertron, and scheduled to release the adventure in September on the Mastertron label. Formerly Carroll Software, Mastertron, the company decided to delay the launch of So-Kiss until now, and cut the price from £1.99 to £1.99.

So-Kiss is available for both Commodore and Spectrum, and contains 16K of program software, with more than 170 illustrated locations and full weapon analysis.

The Christmas release on the Master Adventure label includes Volcano, Dungeon and Black Crystal for the Spectrum, at £1.99 and £1.99 respectively. Black Crystal will be available for the Commodore in the New Year.

Mastertron will remain a separate label, in full-price. Large format packaging and extensive accompanying literature will continue to be the company's hallmark, according to Mastertron.

Marie Allen, Mastertron's managing director, said: "We intend to do the same with

Master Adventure in the field of adventure games as we have with Mastertron in the field of arcade games — in other words, produce a series of good quality programs at a very realistic price."

Master Adventure games will continue to cost full retailing prices. For £1.99 you can expect programs of a quality which would normally cost £3 in the very best."

Mastertron, Park Lane, 177 Park Rd, London NW2 7AL

Venture on

Androgam has announced two new graphic adventures for the Commodore 64, Master Stone and Time Traveller.

Here's the plot of Magic Stone in a nutshell: the stone in question is reported to have laid men paid you must find the stone and the experimental stone, as well as the magic word. The story is a Transylvanian romance.

In Time Traveller you must restore the balance of time, which has been disturbed by the evil Graf von Schwarzenstein.

You have a few problems though — you don't know your history at your history, and you must find that out first.

Easy English language commands, novel music, and a good plot are all slotted in for your interest. And a Kool Pad will be awarded to each of three winners, who manage to solve each adventure in the shortest possible way.

Price £1.99

Androgam, 19 Station Rd, London N4, Hendon, Beds RG4 1AE

QL monitor

From has announced the launch of a new 14-inch monitor for the QL. The QL14 costs £199.99 and comes with connecting cable, which slots into the RGB port.

It is light-weight, and has a retractable handle, which means that it's very portable. The unit is all-black and has a detachable anti-glare glass front.

From's monitor provides full A4-width on QM, better resolution for business graphics with hard, high-contrast blacks with Archive, and a greater number of colours visible on Archive, according to From.

From, From Inc, 10/20 Moss St, City Rd, London EC1 P 8BT



Oric's Oric 164

BASED ON THE POPULAR "FIND THE WORD" GAME
A REAL TEASER AND CHALLENGE FOR
PLAYERS OF ALL AGES

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Possibilità

A L I E N



In space no one can hear you scream.



SENSATION
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well almost

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C16 first

Tynesoft claims to be the first company to have Commodore C16 and Plus/4 software available.

The company is releasing a starter pack for the C16, which will cost £14.95 and contains four games.

Tynesoft, Address: Red Ex, Maydon upon Tyne, Tyne and Wear NE21 4NE

EPROM eraser

Ground Control has now announced the Utopia EPROM eraser.

The Utopia is housed in a 90 x 60 x 40 mm plastic case, and a special type of discharge tube is used to achieve such compact dimensions. According to Ground Controls, the 250 or 110 volt mains powered unit enables up to three EPROMs of any size, on 1 chip with on-board EPROM to be erased in 12 minutes, usually.

Ground Control, Address: Ave, Welwyn, Essex SS2 6LT



Ground Control's Utopia

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VIC-20 PROGRAM

[illegible][illegible]

COMMODORE 64		SPECTRUM	
4000	1000	4000	1000
4001	1001	4001	1001
4002	1002	4002	1002
4003	1003	4003	1003
4004	1004	4004	1004
4005	1005	4005	1005
4006	1006	4006	1006
4007	1007	4007	1007
4008	1008	4008	1008
4009	1009	4009	1009
4010	1010	4010	1010
4011	1011	4011	1011
4012	1012	4012	1012
4013	1013	4013	1013
4014	1014	4014	1014
4015	1015	4015	1015
4016	1016	4016	1016
4017	1017	4017	1017
4018	1018	4018	1018
4019	1019	4019	1019
4020	1020	4020	1020
4021	1021	4021	1021
4022	1022	4022	1022
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4024	1024	4024	1024
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4027	1027	4027	1027
4028	1028	4028	1028
4029	1029	4029	1029
4030	1030	4030	1030
4031	1031	4031	1031
4032	1032	4032	1032
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4037	1037	4037	1037
4038	1038	4038	1038
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4041	1041	4041	1041
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4095			

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Rack your
brains to come
up with the
right word.
Otherwise you
die. Hangman
conversion for
the ZX81 by
Timothy Pearce

Find the word or hang by the neck



Test your knowledge of vocabulary and test your computer at Hangman.

This is a well-known, well-loved game which we are now bringing to your ZX81 screen.

Decide whether you want instructions. Then you'll see a series of asterisks representing a word. If you want to enter your own word, press 4. You will be asked to type in a magic word, with less than 15 letters and made up of letters alone.

If your word doesn't meet the requirements it will be rejected and you'll see **BAD WORD** on screen. After the word has been checked and accepted, a normal screen will be set up. To enter a guess press the relevant key. Do not press **NEWLINE**. Accepted letters and disallowed letters will be ignored. Every occur-

rence of a letter in a word will be shown if correct.

If you can't solve the puzzle and need help, press **HELP**. **LINE**. The screen will clear and revert to normal, but no extra letters will have been entered in the current place. All occurrences of the letter will have been marked.

For **WINNER**, where prompted with the question **Another go?** Y/N, if you type N the program will be lost.

Variables

W0 title of category to use
C00 check value to see if word has been picked before
A00 check value to see if letter has been picked before
Q0 word selected from W0
G0 value returned by RANDIY
R0 random value for the letter
W0 D000, strings
N0: guess word being guessed
T0 total score
I0: correct variable as loop
J0: number of category being used
P0: number of word selected from W0
Y0: number of mistakes faced to select correct letter during selection

How to improve it

Add more categories.
Speed up word selection process by making smaller groups of words in W0 or finding a quicker way of sorting the array, or speed it up by not selecting randomly.

Comments

The string handling functions used could be replaced by **READ**, **D000**, **convert** or **W000** functions could be used in place of the ZX81's unusual string handling method.
Colors could be added to the screen display and sound could also be added.

How it works

20-25 ask if instructions are required, set up reply
25-30 print menu, loop and verify reply
30-35 get appropriate value user will select word to
35-40 disallow repeats
40-45 get appropriate value user check correct
45-50 words made to word on
50-55 user score, return-screen check stop
55-60 set up screen display
60-65: category count and score/variable
65: **PC00** letter,0: status beyond two lines of screen visible
65-70: variables store score variables
70-75: select word
75-80: W000 appropriate number of letters
80-85: repeat guess, return **READY** screen
85-90: variables, check input
90: check not letter at top of screen
90-95: check if letter appears in word
95-100: set up result
100-105: subtracted to draw picture
105-1100: print two line message and whole word, user guess value, print new score, **GO00** repeat prompt
1100-1110: do you want another go?
1110-1120: use category
1120-1130: subtracted score pending to returning P from menu
1130-1140: work out choice
1140-1150: print out status score, screen on line 25

```
10: REM "HANGMAN"
11: REM BY T.J.C. PEARCE 22/4/84
20: NAME "HANGMAN"
30: PRINT "INSTRUCTIONS Y/N"
40: IF ANSWER="Y" THEN GOTO 55
50: IF ANSWER="N" THEN GOTO 25
54: GOTO 25
```


DEFINITION

```

728 IF 20.27 GE X12 OR ELEN 2812
729 THEN GOTO 878
730 IF 2812<0 THEN GOTO 878
731 LET 2812=28
732 GOTO 878
733 PRINT AT 2.1+1000E 28-271,
734
735 LET 0=CU
736 FOR I=1 TO LEN 28
737 NEXT I
738 IF 28=0 THEN LET CU=CU+1
739 IF 28=28 THEN PRINT AT 22,1
740
741 NEXT I
742
743 IF 0=CU THEN LET V=V+1
744 IF 0=CU THEN LET 28=28-1
745 IF 0=CU THEN GOSUB 1000-910
746 IF 28=0 THEN GOSUB 1300
747 CU=LEN 28 THEN GOSUB 120
748
749 GOTO 878
750
751
752 PRINT AT 10.11,
753
754 RETURN
755
756 FOR I=2 TO 12
757 PRINT AT I.10,
758
759 NEXT I
760
761 RETURN
762
763 FOR I=1 TO 4
764 PRINT AT 10-I,11-I,
765
766 NEXT I
767
768 RETURN
769
770 FOR I=4 TO 1 STEP -1
771 PRINT AT 12-I,10-I,
772
773 NEXT I
774
775 RETURN
776
777 PRINT AT 2.0,
778
779
780 PRINT AT 3.0,
781 AT 4.0,
782
783 RETURN
784
785 PRINT AT 2.7,
786 AT 0.7,
787
788 RETURN
789
790 PRINT AT 7.2,
791 AT 0.1,
792 AT 0.0,
793 AT 10.0,
794
795 RETURN
796
797 PRINT AT 2.11,
798 AT 9.12,
799
800 RETURN
801
802 PRINT AT 10.7,
803 AT 12.7,
804 AT 10.7,
805 AT 10.7,
806
807 RETURN
808
809 PRINT AT 11.0,
810 AT 12.0,
811 AT 13.0,
812 AT 14.0,
813
814 RETURN
815
816 LET 20=2
817 PRINT AT 22.0,"YOU LOSE--T"
818
819 GOTO 888
820
821
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825
826
827
828
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```

1370  BOW 18415.7
1375  BOWT "TOW" ON A SINGLE WORD
1380  C WITH UP TO 16 LETTERS AND CONTN
1385  16 LETTERS ONLY"
1390  GOTO 1610
1400  PRINT "*****"
1405  IF BEEK 18415.7 THEN SCROLL
1410  INPUT M$ THEN GOTO 1600
1415  IF USC US:15 THEN GOTO 1600
1420  FOR I=1 TO LEN M$
1425  IF CODE US:I:100 OR CODE M$
1430  THEN GOTO 1600
1435  NEXT I
1440  LET J=0
1445  LET US="00"+US
1450  GOTO 1600
1455  RETURN
1460  FOR I=1 TO 25
1465  LET A$(I)=-
1470  NEXT I
1475  RETURN
1480  REM *****
1485  LET SS=INT (RND*26)+1
1490  IF CODE A$(RND*37+1) THEN C
1500  GOTO 1700
1505  LET LC=0
1510  FOR I=1 TO LEN C$
1515  IF CODE C$(I)+37=SS THEN LE
1520  T=I+1
1525  GOTO 1
1530  IF LC=0 THEN GOTO 1700
1535  FOR I=1 TO LEN SS
1540  IF CODE C$(I)+RND*37 THEN LE
1545  T=I+1
1550  IF CODE C$(I)+37 THEN FR
1555  AT C$(I)+2,CNRS (RND*37)
1560  NEXT I
1565  LET SC=SC+2
1570  LET SS=SS+CNRS (RND*37)
1575  PRINT AT 0.1+RND, "E
1580  GOTO 1
1585  RETURN
1590  REM *****
1600  GOTO 1
1605  PRINT "*****INSTRUCTION
1610  "*****"
1615  PRINT "***** FIRST YOU MUST SE
1620  "***** CATEGORY THAT YOU
1625  "***** WANT TO HAVE A WORD PICKED FROM
1630  "***** IF YOU WANT TO GIVE YOUR OWN U
1635  "***** WORD THEN SELECT NO.9.THIS R
1640  "***** THAT YOU"
1645  PRINT "***** ANY TYPE ANY SINGLE
1650  "***** CONTAINING LETTERS O
1655  "***** OR IF THE WORD IS LONGER THAN
1660  "***** 16 LETTERS OR HAS NON ALPHABETIC
1665  "***** C ITEMS IN IT IT WILL BE REJECT
1670  "***** CO. THE SIGN ***** WILL APPEAR
1675  "***** AND YOU"
1680  PRINT "***** MUST SET YOUR URB
1685  "***** TO 0 THEN CATEGORY THE SCR
1690  "***** WILL BE THEN SET UP FOR IT"
1695  PRINT "***** ANY KEY TO CONTI
1700  NUT"
1705  GOTO 404
1710  GOTO 1
1715  PRINT "***** IF YOU SELECT ANY O
1720  "***** OTHERWISE THE WORD WILL BE
1725  "***** FOR A SHORT TIME AND YOU S
1730  "***** WORD WILL THEN BE SET UP FOR
1735  "***** A RANDOMLY SELECTED WORD FROM Y
1740  "***** CATEGORY"
1745  PRINT "***** TO INPUT A LETTER
1750  "***** JUST PRESS IT AND NEED TO PRESS
1755  "***** 16 LETTERS WILL BE IS
1760  "***** HORED AS WILL REPEATED LETTERS"
1765  PRINT "***** IF YOU NEED A CLU
1770  "***** THEN PRESS NEULINE AND ALL T
1775  "***** OCCURRENCES OF ONE LETTER INTH
1780  "***** WORD WILL BE REPEATED"
1785  PRINT "***** AFTER PRESS LETTERS EACH
1790  "***** ALPHABETICALLY"
1795  PRINT "***** ANOTHER 25 C
1800  "***** THE PROGRAM WILL BE LOO
1805  PRINT "***** ANY KEY TO CONTINU
1810  NUT"
1815  GOTO 404
1820  GOTO 1
1825  GOTO 1
1830  GOTO 1
1835  GOTO 1
1840  GOTO 1
1845  GOTO 1
1850  GOTO 1
1855  GOTO 1
1860  GOTO 1
1865  GOTO 1
1870  GOTO 1
1875  GOTO 1
1880  GOTO 1
1885  GOTO 1
1890  GOTO 1
1895  GOTO 1
1900  GOTO 1
1905  GOTO 1
1910  GOTO 1
1915  GOTO 1
1920  GOTO 1
1925  GOTO 1
1930  GOTO 1
1935  GOTO 1
1940  GOTO 1
1945  GOTO 1
1950  GOTO 1
1955  GOTO 1
1960  GOTO 1
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1975  GOTO 1
1980  GOTO 1
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1995  GOTO 1
2000  GOTO 1
2005  GOTO 1
2010  GOTO 1
2015  GOTO 1
2020  GOTO 1
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2070  GOTO 1
2075  GOTO 1
2080  GOTO 1
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2090  GOTO 1
2095  GOTO 1
2100  GOTO 1
2105  GOTO 1
2110  GOTO 1
2115  GOTO 1
2120  GOTO 1
2125  GOTO 1
2130  GOTO 1
2135  GOTO 1
2140  GOTO 1
2145  GOTO 1
2150  GOTO 1
2155  GOTO 1
2160  GOTO 1
2165  GOTO 1
2170  GOTO 1
2175  GOTO 1
2180  GOTO 1
2185  GOTO 1
2190  GOTO 1
2195  GOTO 1
2200  GOTO 1
2205  GOTO 1
2210  GOTO 1
2215  GOTO 1
2220  GOTO 1
2225  GOTO 1
2230  GOTO 1
2235  GOTO 1
2240  GOTO 1
2245  GOTO 1
2250  GOTO 1
2255  GOTO 1
2260  GOTO 1
2265  GOTO 1
2270  GOTO 1
2275  GOTO 1
2280  GOTO 1
2285  GOTO 1
2290  GOTO 1
2295  GOTO 1
2300  GOTO 1
2305  GOTO 1
2310  GOTO 1
2315  GOTO 1
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2380  GOTO 1
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2455  GOTO 1
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2465  GOTO 1
2470  GOTO 1
2475  GOTO 1
2480  GOTO 1
2485  GOTO 1
2490  GOTO 1
2495  GOTO 1
2500  GOTO 1
2505  GOTO 1
2510  GOTO 1
2515  GOTO 1
2520  GOTO 1
2525  GOTO 1
2530  GOTO 1
2535  GOTO 1
2540  GOTO 1
2545  GOTO 1
2550  GOTO 1
2555  GOTO 1
2560  GOTO 1
2565  GOTO 1
2570  GOTO 1
2575  GOTO 1
2580  GOTO 1
2585  GOTO 1
2590  GOTO 1
2595  GOTO 1
2600  GOTO 1
2605  GOTO 1
2610  GOTO 1
2615  GOTO 1
2620  GOTO 1
2625  GOTO 1
2630  GOTO 1
2635  GOTO 1
2640  GOTO 1
2645  GOTO 1
2650  GOTO 1
2655  GOTO 1
2660  GOTO 1
2665  GOTO 1
2670  GOTO 1
2675  GOTO 1
2680  GOTO 1
2685  GOTO 1
2690  GOTO 1
2695  GOTO 1
2700  GOTO 1
2705  GOTO 1
2710  GOTO 1
2715  GOTO 1
2720  GOTO 1
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2735  GOTO 1
2740  GOTO 1
2745  GOTO 1
2750  GOTO 1
2755  GOTO 1
2760  GOTO 1
2765  GOTO 1
2770  GOTO 1
2775  GOTO 1
2780  GOTO 1
2785  GOTO 1
2790  GOTO 1
2795  GOTO 1
2800  GOTO 1
2805  GOTO 1
2810  GOTO 1
2815  GOTO 1
2820  GOTO 1
2825  GOTO 1
2830  GOTO 1
2835  GOTO 1
2840  GOTO 1
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2865  GOTO 1
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2955  GOTO 1
2960  GOTO 1
2965  GOTO 1
2970  GOTO 1
2975  GOTO 1
2980  GOTO 1
2985  GOTO 1
2990  GOTO 1
2995  GOTO 1
3000  GOTO 1
3005  GOTO 1
3010  GOTO 1
3015  GOTO 1
3020  GOTO 1
3025  GOTO 1
3030  GOTO 1
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3040  GOTO 1
3045  GOTO 1
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3055  GOTO 1
3060  GOTO 1
3065  GOTO 1
3070  GOTO 1
3075  GOTO 1
3080  GOTO 1
3085  GOTO 1
3090  GOTO 1
3095  GOTO 1
3100  GOTO 1
3105  GOTO 1
3110  GOTO 1
3115  GOTO 1
3120  GOTO 1
3125  GOTO 1
3130  GOTO 1
3135  GOTO 1
3140  GOTO 1
3145  GOTO 1
3150  GOTO 1
3155  GOTO 1
3160  GOTO 1
3165  GOTO 1
3170  GOTO 1
3175  GOTO 1
3180  GOTO 1
3185  GOTO 1
3190  GOTO 1
3195  GOTO 1
3200  GOTO 1
3205  GOTO 1
3210  GOTO 1
3215  GOTO 1
3220  GOTO 1
3225  GOTO 1
3230  GOTO 1
3235  GOTO 1
3240  GOTO 1
3245  GOTO 1
3250  GOTO 1
3255  GOTO 1
3260  GOTO 1
326
```

Racing cars

Speed is the essence of this game. Overtake cars, but avoid crashing with them. You'll be surprised just what can be done using 4K and sprite graphics. By HCW regular Shingo Suglura

This is a simple racing game for the computerised home kit with BASIC1 or BASIC-D. You control a racing car at the middle of the screen. You must avoid the cars you overtake, using the left and right control keys to move left and right respectively.

This program shows what can be done in just 4K using sprite graphics. If you do have BASIC-D you can probably make a much more exciting happening in a time or two's construction, as you have at least 4K to play with.

How to proceed

This program's main features are: downward scrolling and sprite graphics and if your machine does not have sprite graphics, it would be fairly difficult to convert it. However, here are a few hints:

FILE NAMES: some keyboard a value of key pressed

LOC 2 TO 5,7: press space No. 1 to 5,7

OUT 430,5: equivalent to OUTP at 430,430

LOC 60,60: both sprite coordinates

LOC 5: define set of sprite

PRINT 130000: equivalent to PRINT 140 at PRINT AT 130000

SCREEN: define character

How to make

10: call procedure to define character

20: call procedure to number variables

30: home cursor and scroll screen one line down

40: press keyboard, take appropriate action

50-60: scan keyboard, take appropriate action

70: print your racing car

How to make

80-170: make other cars

180: check if your car has reached

190: if a race's, go back to beginning

200: call procedure to enlarge screen

210: another game

220-230: calculate variables screen

240-420: procedure to print explosion, end screen

430-100: define various character



```

10 HOME: JDEFIHE
20 HOME: #INIT
30 PRINT "RAC"
40 IF T=1 THEN LET T=0:LET " "=""
50 LET S=0:IF (87026/10) < 54 THEN LET S=+1:IF S=0
60 IF S=0 THEN LET H=-(40/152)+0
70 LOC 0 TO H,140
80 FOR I=0 TO 1
90 LET I=1 TO H:LOC I,140
100 LET V:LOC I=V:LOC I=SP:LOC I=V:IF V:LOC I>100 THEN LET V:I=
20
110 IF (40/10)=0+(40/100) THEN LET SP:LOC I=40+(40/100):IF SP
LOC I>16 THEN LET SP:LOC I=20

```

PROGRAM

```

120 let X=C11:=X(C11)+C(C11)+1 if X(C11)>12 then let C(C11)=1+4
130 if X(C11)<50 then let C(C11)=1+4+3+3
140 if (V(C11)+1553+(V(C11)+1400)+(C11)+(V(C11)+100)+(V(C11)+X-16
150 then let C=C+1
160 let KU=CU+1 if KU=50 then let SP(C)=10000 520,400
170 if KU=120 then let SP(C)=20000 520,450
180 next 11
190 loc 4 to X,C11 let K1=K1+40 if K1>200 then if X=60 then
200 let K1=500 let KK=100 else let K1=100 let KK=60
210 if KK=0 then goto 30
220 goto 20
230 goto 20
240 let C=C+1
250 print "X=";X;C11;K1;K1+40;K1>200;X=60;K1=50;KK=100;KK=60;
260 let C11=200 let V(C11)=10 let C(C11)=50 let SP(C)=500
270 out 520,SP(C) 520,SP(C) 520,SP(C) 520,SP(C)
280 for I=1 to 11
290 print " "
300 return
310 C=C+1
320 scc 1 to X-150 loc 0 to 40,150
330 for I=1 to 41 loc 1 to 40,150 next
340 for I=1 to 500 next
350 scc 1 to X-5,140
360 for I=1 to 500 next
370 scc 1 to 40,150
380 let SP=0 let SC=(50+KU)+100 let KU=0
390 print cursor(11,5) "Your score:"
400 print cursor(13,10) "SC:"
410 print cursor(11,36) "X to play:" out 520,SP
420 if SC<17000 then goto 410
430 return
440 scc 1 to X-150 loc 0 to 40,150
450 print " "
460 scc 1 to X-150 loc 0 to 40,150
470 scc 1 to X-150 loc 0 to 40,150
480 scc 1 to X-150 loc 0 to 40,150
490 scc 1 to X-150 loc 0 to 40,150
500 scc 1 to X-150 loc 0 to 40,150
510 scc 1 to X-150 loc 0 to 40,150
520 scc 1 to X-150 loc 0 to 40,150
530 scc 1 to X-150 loc 0 to 40,150
540 scc 1 to X-150 loc 0 to 40,150
550 scc 1 to X-150 loc 0 to 40,150
560 scc 1 to X-150 loc 0 to 40,150
570 scc 1 to X-150 loc 0 to 40,150
580 scc 1 to X-150 loc 0 to 40,150
590 scc 1 to X-150 loc 0 to 40,150
600 scc 1 to X-150 loc 0 to 40,150
610 scc 1 to X-150 loc 0 to 40,150
620 for I=1 to 11
630 scc 1 to X-150 loc 0 to 40,150
640 scc 1 to X-150 loc 0 to 40,150
650 scc 1 to X-150 loc 0 to 40,150
660 scc 1 to X-150 loc 0 to 40,150
670 scc 1 to X-150 loc 0 to 40,150
680 scc 1 to X-150 loc 0 to 40,150
690 scc 1 to X-150 loc 0 to 40,150
700 scc 1 to X-150 loc 0 to 40,150
710 scc 1 to X-150 loc 0 to 40,150
720 return

```


Home Computing Weekly
brings you Mike Robert's
detailed guide to home
computers, whether you're
about to splash out on your
first micro or you're moving
up and on. You'll find it
invaluable

**Urgent:
Read before
you buy!**

Chris is a computer, the computer is a man, and no computer is ever taking in the same information twice.

To help this poor, beset overwhelmed in the confusing world of computers, Mike Robert

discusses and offers practical advice, saving a considerable time to help the reader to find the right computer for the job, and to build the most, even if it is a home computer, into the world of home computers under 1000.

Each machine has all the latest details on its hardware, software, and its use in a number of different ways, and a number of other points under its own heading. There is an explanation of what they are

Keyboard: Specification and space of the keyboard.

Screen: General details of the display. Requirements of graphics refer to the number of dots across and down the screen, the more the better. The colour requirements should be obvious. Speed refers to advanced graphic image manipulation in hardware, which a few machines have.

Sound: Audio ability.

Speed: Overall running speed. **Language:** Description of the operating language of the computer (usually BASIC) and a list of the others which may be available.

Processor: Brand of the central processor. The best and most common processor for home use is the 8085 — in one of its many variants. The 286 is also popular, but mainly in

the older type of business machine.

I/O: This is a computer's method of talking to the outside world. It has many jacks, ports, printer connections or any other non-driver connections.

Software: A hard word as what kind of software is available for the machine and at what cost.

Options: This is what I think of the machine after using it, and comparing it to all the others in the lot.

If you are buying a second computer or upgrading, the list of specifications should help you in choosing a machine which isn't too far away from what you've been used to. I wish you luck, and rather like this ad!

included. Very good at various functions like graphics, sound and scanning that needs space everywhere which is very relevant. The editor is also rather crude. BASIC has some bugs in it. **Processor:** 286A. **Speed:** Fast.

Software: Amstrad, the software arm of Amstrad, is coming across to buy a range of software so it can get together. There should be lots of games out in the very near future. The games currently out are very poor quality but should improve.

Options: Good value with the advantage of a magazine and a tape recorder. Reliability may be a problem as Amstrad has a bad reputation for this. Tape recorder can be incompatible with each other in fact made

ATARI 600XL/800XL

Price: £99/£199

Memory: 16K/64K

RAM: 16K/64K (expandable) **varies with graphics mode used: 32K ROM**

Keyboard: Full typewriter style keyboard, 58 keys, four function keys, space bar but no dedicated cursor control keys. **Screen:** 40 screen modes comprising five text modes and 31 graphics modes. Text is 40 columns by 24 lines to up to 256 colours. The graphics have a maximum resolution of 320 by 200 in the highest text mode. All characters are user definable and come in predefined shapes to suit work. **Player/missile graphics** — like sprites — are also available. **Sound:** Four channel sound

contrast with full software support.

Language: Atari BASIC included and there are available Fortran, Pascal, Logo, WSDW, Pascal, Microsoft BASIC. Two types of assembler also are also available.

Processor: 6502A.

Speed: Modest to fast.

I/O: Serial input/output port along with two connectors for two joysticks or paddles. Other modules may be added via interface bus. Slot for 800K cartridges. Cassette port will only allow connection of Atari cassette recorder at £44.99, so this must be taken into account when considering costs.

Software: The XL series of software is compatible with older models so lots of software is on sale from both Atari — which has a library of 300 titles — and from independents, including US imports.



Atari 600XL



Atari 800XL



Amstrad CPC464

ATMOS

Price: £99-179

Memory: 64K RAM

16K/32K usable in text

mode, 32K in

graphics mode:

16K ROM

Keyboard: Full typewriter, 37 keys, space bar, dedicated cursor control keys, no definable function keys, two function per key.

Screen: 40 columns by 24 lines

Video: 1600x1200 pixel display, two user definable character sets, eight foreground and eight background colours, double height, flashing and inverted attributes available for each character. Graphics modes give 240 by 200 resolution, colours and attributes are definable on a grid of 40 by 200. In each of these areas the foreground and background can be defined in eight colours. Flashing and inverted colours is also supported. In graphics mode three lines on the monitor

off the screen, also appears, and they are the same as the big, real ones.

Sound: Sound generator with three channels and noise generator. There is a volume control, a microphone control. Pre-programmed sounds to produce noise and rain, etc. Sound is produced through an internal speaker although hi-fi sound is available through a DIN socket.

Languages: Extended Microsoft BASIC built-in, available. BBC-BASIC planned. Proscript BASIC.

Hardware: 160 Channels parallel printer port, user port, monitor port, expansion connector.

Software: Radio supported from day one. Range growing rapidly.

Opinion: This computer was originally compared to the Spectrum, and this was justified as they were comparable neither in look nor size. The BBC is a more and a more standard form of the de facto standard Microsoft BASIC. The keyboard is better, the graphics are better, and a real real sound which is lacking in the Sinclair machine. Instructions are built in which would normally cost extra. The chips that the Spectrum has is a great software. The more recent Spectrums and are not some of the available software due to internal design differences.

BBC B

Price: £399
Memory: 32K RAM
128K to 96 usable
depending on
graphics mode used
32K ROM

Keyboard: Typewriter style, 71 keys, 10 user definable function keys, dedicated cursor control keys. Space bar.

Screen: Very complex. The simplest mode is Teletext compatible and gives eight colours, fading characters, double height, and block graphics. This is 40 columns by 15 lines. There are seven other modes of screen operation ranging from 440 by 156 to one in two colours with 80 by 32 lines to 148 by 284 to one in eight colours with 38 by 32 lines. All 256 characters are user definable in all but the Teletext mode.

Sound: Three channels more with a noise channel through internal speaker. Full synthesis program is available from BBC.

Languages: BBC BASIC is included — a very complete

language implementation. An assembler is also built in for machine code scripts. Fortran, Lisp and BCPL are also available.

Processor: 6801A.

Speed: 7MHz.
160 55 415 and Cerebras centre point. Four analogue to digital converters for joystick in, eight bit programmable user port. The mode allows connection of processors and up to six machines. Local networking, speech synthesizer can be added.

Add-ons: A great deal available both from independent and

Hardware: A very large and well-specified range available, including a lot from Acornsoft, the maker's software arm. Many educational programs of varying quality.

Opinion: The BBC is an excellent machine if you want the high price. Support from independent suppliers is superb, but Acorn has been slow in the hardware side. The keyboard is very good and there is a useful set of function keys. The screen uses split screen screen editing which is the most best thing to full screen editing but not quite as easy to use.

The BBC is complex and makes good use of all the hardware features. This

computer is used by about 15 per cent of all secondary schools, so is a good for education as well as games. It also makes a good business computer, particularly with networking available.

COMMODORE C16

Price: £139
Memory: 18K RAM
128K or 4K usable
depending on
graphics mode used



Commodore C16

Keyboard: Same as Commodore 64 except that function

Spectrum better. The best value computer on the market, comes complete with software and a tape recorder.

COMMODORE PLUS/4

Price: £299
Memory: 64K RAM 32K ROM 160K or 32K usable depending on graphics

Keyboard: Similar to the 5000 in feel. Function keys can be defined from BASIC. Connect keys with a price slightly over



BBC B

Screen: Same as C16.
Sound: Same as C16.
Language: 7001 (6502 computer).
Price: 1699 (6502 computer).
Speed: Fast to medium.
Software: Four basic/bonus packages built in — spreadsheet, word processor, database, graphics. Games software should appear as this machine is compatible with the C16.
Options: As this computer can run all C16 software, games should be widely available after Christmas.

COMMODORE 64

Price: £199
Memory: 64K RAM
640K usable 32K ROM

Keyboard: Typewriter quality, 47 keys, space bar, dedicated function keys although full use of these can only be had through an expansion program. **Screen:** 40 columns by 25 rows, 16 colours, all characters are definable, lower case, lower case, two character sets. There are two different set modes but the layout is the same for all. The only difference is in the handling of the cursor.

There are two graphics modes, 128 by 256 and 144 by 256 resolutions in 16 colours. The difference is in the way colour can be used with the graphics system, similar to the Spectrum, while the other uses a palette system where each dot is its own individual colour, similar to the BBC or Dragon computers.

Unfortunately the BASIC doesn't support the graphics as you must write your own program to use a BASIC extension. Mode may also be used right across and available although the BASIC does not support these directly, instructions are given in the manual on how to achieve them.

Sound: Three channel music synthesiser. Full envelope control and waveform selection. BASIC does not support sound directly although, like the Spectrum, instruction is given in the manual on how to use sound. **Language:** Commodore BASIC, supplied. Screen's BASIC, Basic, Pico, LOGO, Pascal available from Commodore along with BASIC computer.

Price: 6502 (6502 computer) with memory banking, 128 available, as option.

Speed options

IO: IEEE 488 serial bus, RS232, cart port, cartridge port, two Auto-type joystick ports, four analog to digital converters for paddles or proportional joysticks.

Add-on: Most of the VIC-II add-ons produced by Commodore will fit. Others are exclusive to the 64 graphics. The cartridge port, like the 64000 processor with CP-16, there is also a speech synthesiser and several other options, including 32 megabyte hard disk and dual-head printer. Many add-ons available from independent.

Software: There is now quite a lot of software around, both for games and utility applications. With business software and the vast amount of device peripherals, the Commodore 64 is one of the few computers which can be seriously considered as an office/business machine as well as a home computer.

Options: An excellent computer and the available commercial software makes good use of its features. The big drawback is that the BASIC is simple, making it hard to write your own programs using the sophisticated features. Screen's BASIC, on cartridge, goes some way to make curing this.

On the other hand, it is easy to use and memory power is not used to provide interchangeable functions in the expense of the functions you really need. It is almost totally compatible with the BBC's standard computer.

And the other hand, the software that provides Commodore's own cassette recorder must be bought in tape form. Although cassette to cassette recorders do exist, it is a pain to go for Commodore's reliable recording.

DRAGON 32

Price: Less than £100
Memory: 32K RAM
320K to 248K RAM usable depending upon graphics mode used 16K ROM

Keyboard: 32-key typewriter style, space bar, no user definable minor window keys. Keyboard quality could be improved.

Screen: Text mode 32 columns by 24 rows, one or two colours.

no lower case or user definable graphics in colour, but there is an optional output option. Text mode does have block graphics in colour through Graphics mode ranges from 256 by 128 to one colour to 128 by 128 in four colours. Text is well supported in this mode.

Sound: One channel music generator circuit. The circuit, good but not great. **Language:** Microsoft Extended Color BASIC included. Identical to Tandy colour computer BASIC. Other languages from independent.

Processor: 68008.
Software: Quite a lot available from Dragon and independent and Tandy (but check).

Options: This micro is limited by its very basic sound system and its horrible text mode with very limited features. The BASIC is very good in manipulating screen graphics although



Commodore 64



Dragon 32

it does not allow processing an algorithm much faster than the Tandy computers so while it is a smaller machine it already has much of the expense which comes in even cost for the Tandy machine and at a price that is lower than the base retail price of the Tandy machine.

Also, it's important to consider is the increasing availability of this machine over the backdrop of Deane.

DRAGON 64

Price: Varies \$300 +
Memory: 64K RAM (up
to 40K usable) 16K
ROM

Dragon's big model offers three modes of operation: an emulator of the Dragon 32, Extended BASIC with 48K of usable RAM or what the company calls a 'soft emulator'. In this mode the BASIC is tweaked so for machine code programs or to add languages like Pascal. An MSX2 emulator is standard and the C64 multi-user operating system can be added. A small amount of dedicated software, including business applications is available at present.

ELECTRON

Price: £155
Memory: 32K RAM (8K
to 12K usable
depending on
graphics mode used)
32K ROM

Keyboard: Typewriter style, 34 keys, space bar, no dedicated cursor control keys, no dedicated user definable keys, though the numeric keys double with the use of a function key. **Screen:** Similar to the BBC model, except for the lack of Teletext mode, sound and speed. **Sound:** One channel through internal speaker, otherwise to BBC.

Language: BBC BASIC is built in, FORTRAN and LISP are available.

Processor: 6502A

Speed: Medium

I/O: None on basic machine though there is an expansion slot into which an expansion board can be plugged giving the same sort of interlocking options as the BBC but at extra cost. **Software:** A growing range of software houses convert BBC programs.

Options: As the computer is very similar to the BBC with only minor differences control

but there is the BBC plus that fact, except for the software options.



Dragon 64

MSX

Price: Varies, around
£250-£300
Memory: Usually 64K
RAM (24K usable) 32K
ROM

Keyboard: Just about the only thing that varies from machine to machine. They can be quite good but I have used some awful ones. Seventy-four keys including five function keys and dedicated cursor control keys, but this can vary. **Screen:** Up to 40 x 34 text with 320 x 200 graphics in 15 colours. All characters are definable. **Sound:** Three channels plus more.

Screen: Up to 40 x 34 text with 320 x 200 graphics in 15 colours. All characters are definable. **Sound:** Three channels plus more.

Language: Microsoft MSX BASIC built in. Pascal and Fortran may be available. **Speed:** Medium

Software: Very little at present although it may pick up as software houses start converting their existing games to fit MSX.

Options: MSX is not a single computer, rather a single design of computer made by different Japanese and few European electronics companies. The only difference between models is the keyboard and external styling, although some machines such as the Yamaha and the Sony are worthy exceptions. Having more controllers and light pen options, respectively.

That has the advantage that all of the machines should be able to run the same software (although in practice this is not so) and, as a general or basic error, hardware.

The resulting interoperability between many Japanese companies has resulted in a very

robust computer. Software support, marketing, and price will determine whether these machines become successful.



Sinclair's MSX

SINCLAIR QL

Price: £305
Memory: 128K RAM
44K ROM (36K usable)

Keyboard: Plastic caps on rubber membrane. Early machines had some problems but later models are OK. 40 keys including function and cursor keys.

Screen: 312 x 238 or 304 colours and 256 x 238 in eight colours. The price of the machine was available but would that game which used the screen to scroll is difficult to write.

Sound: Sony
Language: SuperBASIC is built in. A version of BASIC

will carry out some advanced steps in much more advanced languages. Limited editor. There is a large range of languages available, including BASIC, Lap, Fortran and Pascal. **Processor:** 68000

Speed: Fast, but not fast enough.

I/O: Large edge connector and two RS232 ports (not fully implemented).

Options: This should have been the main machine of 1984/85 but due to being launched before a real study and software houses' reluctance to duplicate Microdrive-based software, it has failed to live up to expectations. The 68000 processor is one of the fastest chips, usually available, and

BUYERS' GUIDE

judgements. Removal of a removed module should not add a tape interface this computer could still be a major machine.



QL

SINCLAIR ZX SPECTRUM

Price: £99£125
Memory: 16K/48K RAM
(7.5K/35.5K usable) 16K ROM

Keyboard: Full-size type, 40 keys, no space bar, definable function keys, no dedicated cursor control keys, five or six functions per key.

Screen: 32 columns by 24 rows, but only 22 rows are available to the user. 256 by 176 high resolution graphics supported by BASIC, two colours from a palette of eight are available in 704 area on the screen. Foreground and background colours for each of these areas can be selected as well as whether the content of the area are flashing or not. Two levels of memory are also supported. Twenty-one user defined characters are available. Supports internal floppy.

Language: Sinclair BASIC. This version is no extended.



Spectrum

SINCLAIR ZX SPECTRUM +

Price: £179
Memory: 48K RAM
(39.5K usable) 16K ROM

Keyboard: Modified keyboard.

form of the type used in the ZX80. The extensions do not even structured programming or all functions and only deal with the graphics and file handling. This BASIC is very non-standard.

Software: A lot of software is available for almost all applications, particularly games.

Options: When the Spectrum first appeared it was an improvement on the lowest priced colour computer. The newer designs have arrived recently with better technical specifications and more usable memory in similar prices.

The colour display is not good and a colour display cannot be produced on a few colour TVs. With the Spectrum there are a lot of keyboards to be fitted on a small keyboard. Sound is through a speaker only the range of software is enormous.

The 16K version is no longer made.

from 1977 to the Spectrum 7. Also tried to find out a better version and was not really happy.

Screen: Same as ZX Spectrum. Unimproved same as ZX Spectrum.

Processor: Same as ZX Spectrum.

Speed: Same as ZX Spectrum. No similar expansion port as the ZX Spectrum. But the physical shape of the back of the machine prevents most independent add-ons. Fitting perfectly although nearly all can be fitted to fit the back, although this is not recommended.

Software: Same as ZX Spectrum although there are some problems with file handling, fonts, and labelling as detailed above.

Options: When you consider this a Spectrum 7 it is 160 more than a C16 with tape recorder included. A Spectrum 7 and a speech interface costs more than a Commodore 64, and a Spectrum 7, speech interface and a speech interface costs as much as an Amstrad. It looks very bad value. It would be reasonable value for money at about half its current price.



Spectrum

VIC-20

Price: £139
Memory: 6K RAM (3.5K usable) 20K ROM

Keyboard: Typewriter quality, 47 keys, space bar, dedicated cursor controls, five or six functions per key.

Screen: 32 columns by 24 lines, eight colours for text, 16 for background, border and graphics. All characters user definable, lower case, inverted output, two character sets. No room possible with expansion cartridge or with extra programming line. BASIC does not support this. Two modes, 160 by 128 in eight colours and 80 by 128 in 16 colours.

Sound: Three channels and one user channel getting more voices through TV speaker.

Language: Commodore BASIC applied, compatible with PET and Commodore 64. Extended BASIC, in more cost given access to the 16 reg, typed and user definable functions.

keys. North, Control and Pause are available.

Processor: 6502A.

Speed: Medium.

I/O: IEEE 488 serial bus, RS232C, user port, cartridge port, joystick port, two parallel ports, two analogue to digital converters.

Software: Many cassette tapes and cartridges from independent and Commodore.

Options: This is a good machine to get started on and it comes in a package containing a computer, a cassette recorder, a keyboard, a tape, a 3.5K machine is somewhat of the. The BASIC is very easy to learn and a Micro soft-compatible. This type of BASIC was first used by Commodore on the first widely available micro in 1977 so there is a lot of compatible software around.

The C16 is intended to replace the VIC 20. No more VIC-20s are being made.



VIC-20

with built-in video output. Many good quality. Better layout to the ZX Spectrum has with long space bar, dedicated cursor control keys, and 14 other keys. Key layout means that it is difficult to play system games and control in situations may be uncomfortable. It is good to have a good layout. It is good to have a good layout.

Ziggurat 48K Spectrum £2.99

Software Supermarket

Ziggurat is an old-vintage game — and that's about the best of the commercial! Your mission is to collect and collect the gold coins hidden, hidden in mysterious collection of rooms. Each room is designed for you, and on two adjacent, but the graphics in each landscape are always identical, open from colour. Colour is also added to the text and the characters on the screen are added to give a better appearance.

There is a help manual, but you are only allowed to use a few pages. You may have a partially completed game to continue later.

The layout makes it good for

use most experience in the acceptable commands.

Despite being in the hand around a few by the gold coins, you are in a few locked doors, although one does require you to get the better of a particularly vicious type.

Also, the left to the surface defeat the. As is Ziggurat is a particularly simple, but could be in more than one way. This is correct, but the 80 is impossible on the first. Ziggurat is actually a very

easy

reviewer last
playability
graphics
value for money

100%
100%
100%
100%



The Wrath of Magra 48K Spectrum £

Conrad, 4 Brandon Rd, South
Isles SL2 2JL

Long before the dawn of machine commands, when there were no more than a few things to do, the Wrath of Magra was a game of the early days, and would be a good start of the series.

There is a lot of things to do, but the Wrath of Magra is a game of the early days, and would be a good start of the series.

The Wrath of Magra, which was a game of the early days, and would be a good start of the series.

The game is a good start of the series.

level, but you can't progress to a higher level and you have to be a bit of a mind to win it. The Wrath of Magra, which was a game of the early days, and would be a good start of the series.

reviewer last
playability
graphics
value for money

100%
100%
100%
100%



First and Last TI-99/4A £5

Madison Software, 10 Alton
Rd, Brighton

This program demonstrates what can be achieved using graphics and computer simulations in a computer.

Control use of colour and design has produced a picture of a character which is highly realistic.

The game has an interesting theme, much more than a 'first and last' story. It is a story of a man who is a hero, and a story of a man who is a hero.

The main character is a man, a man who is a hero, and a story of a man who is a hero. The game has an interesting theme, much more than a 'first and last' story. It is a story of a man who is a hero, and a story of a man who is a hero.

Each scene is completed when the player has finished the game, and the player has finished the game.

There is a Hall of Fame in which all of the players are listed, and the player has finished the game. The game has an interesting theme, much more than a 'first and last' story. It is a story of a man who is a hero, and a story of a man who is a hero.

reviewer last
playability
graphics
value for money

100%
100%
100%
100%



Mystery and drama

Here are a few adventures to
stretch your mental abilities.
Read what our reviewers have
to say

The Prince 48K Spectrum £7.95

A.C.E., 14 Langer Way, Los
Angeles CA 90047

This is an adventure game which really demands that you play it. The game is a story of a man who is a hero, and a story of a man who is a hero.

Each player has to approach the game in a way that is a story of a man who is a hero, and a story of a man who is a hero. The game has an interesting theme, much more than a 'first and last' story. It is a story of a man who is a hero, and a story of a man who is a hero.

and therefore how well you are doing. It is a story of a man who is a hero, and a story of a man who is a hero.

reviewer last
playability
graphics
value for money

100%
100%
100%
100%



Escape From The Planet Brontitor TI-99/4A £4.95

EP Software, 1 South Pl
Avenue, SE1 1JQ

This is a very basic adventure game, but it is a story of a man who is a hero, and a story of a man who is a hero. The game has an interesting theme, much more than a 'first and last' story. It is a story of a man who is a hero, and a story of a man who is a hero.

When you load and run the program, you are a story of a man who is a hero, and a story of a man who is a hero. The game has an interesting theme, much more than a 'first and last' story. It is a story of a man who is a hero, and a story of a man who is a hero.

One of the things you are a story of a man who is a hero, and a story of a man who is a hero. The game has an interesting theme, much more than a 'first and last' story. It is a story of a man who is a hero, and a story of a man who is a hero.

Each player has to approach the game in a way that is a story of a man who is a hero, and a story of a man who is a hero. The game has an interesting theme, much more than a 'first and last' story. It is a story of a man who is a hero, and a story of a man who is a hero.

reviewer last
playability
graphics
value for money

100%
100%
100%
100%



If you think that you can survive the rat race then try this original game by Andrew Bird. You'll need fast reactions

Situation vacant

SITUATIONS VACANT

1000

1. **QUESTION** 1-10
2. **ANSWER** 1-10
3. **QUESTION** 1-10
4. **ANSWER** 1-10
5. **QUESTION** 1-10
6. **ANSWER** 1-10
7. **QUESTION** 1-10
8. **ANSWER** 1-10
9. **QUESTION** 1-10
10. **ANSWER** 1-10

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PLATE 100. *ALCANTARA-DE-CELA*

THE

Abstract

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RECEIVED 12/1/97

1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

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1000



The game takes you into the competitive world of the publisher and gives you a taste of the industry.

You have applied for the post of shoeshed typist and think that you stand a pretty good chance of getting the job. Then it, until you meet the other contenders for the position. Hazel and Sandra are extremely fast typists and they're both very keen on the job.

Your prospective boss has set all these up for you in a system now, and you must have Excel and Word.

This game tests your skill on the keyboard, pressing letters after letters in an attempt to finish the run before the other monkeys.

Speed is the answer if you want a true full stage production.

[illegible]

1-00	resistance; set cage lock
	keyswitch temp, on
00-00	draw gear
000-000	start loop
0000-1100	upset; 1 routine
	condition
0000-1100	upset; 2 routine; zero
0000-1100	upset; 1 routine
	draw
0000-0000	print results of test
0000-0000	condition; enter program
	test
0000-0000	print error message
0000-0000	condition; zero

1. **Introduction**

- all names output
- ack compares last name with
- name
- is instantaneous
- p1.p2.p3 position of paper
- length
- center, last random number to
- double speed of type
- inner, next random number to be
- printed
- i displays if letter generated
- s sum to calculate power's speed
- n number of keys to type
- f several answers know

11/11/2011 11:11 AM



Listing

```

1 REM Typist required                               By A.B.Bird 1984
2 PRINT AT 10,10;"Please Wait": GO SUB 5000
3 MORE 23400,30: MORE 23400,8: LET aa=""
4 BORDER 7: PAPER 7: CLS
5 PRINT AT 20,0: INVERSE 1: INK 2: Typist Required  "I INK 2" By A.B.Bird,

  & INPUT "name ? "p1: IF aa="" THEN GO TO 10
  7 LET aa=p1: GO SUB 7000
10 LET i=0: LET ty=0: LET a=1: LET p1=00: LET p2=00: LET p3=00
15 REM Draw game
20 CLS : FOR f=17 TO 21: PRINT AT f,0: PAPER 1:
  "I NEXT f
30 FOR f=1 TO 23 STEP 11: FOR n=12 TO 14: PRINT PAPER 2:AT n,f:
  "I NEXT f
40 FOR f=15 TO 17: PRINT PAPER 2:AT f,1: "IAT f,2: "IAT f,12: "IAT f,19:
  "IAT f,23: "IAT f,30: "I NEXT f
50 FOR f=11 TO 13: PRINT PAPER 3:AT f,3: "IAT f,14: "IAT f,23: "I
  NEXT f
60 INK 0: FOR f=24 TO 200 STEP 50
  70 PLOT f,11: DRAW 0,13: PLOT f+2,11: DRAW 0,13: FOR n=1 TO 4: PLOT f,120+n
  DRAW 11,n+2: NEXT n
  80 PLOT f+19,11: DRAW 0,13: PLOT f+21,11: DRAW 0,13: FOR n=1 TO 4: PLOT f+23
  ,120+n: DRAW -11,n+2: NEXT n
  90 FOR f=4 TO 26 STEP 11: PRINT AT f,f: INK 1:"AC":AT f,f: INK 2:"CD": NEXT f
  100 FOR f=2 TO 24 STEP 11
  110 PRINT AT f,f: INK 0:"A":AT 0,f:"C":AT 10,f:"C":AT 11,f:
  "IAT
  T 11,f+5:"I"
  120 PRINT AT 15,f+1: PAPER 0: "IAT 10,f+2: INK 7:"EF":AT 14,f+2: PAPER 7: I
  NK 3:"IJ":AT 17,f+2:"KL": NEXT f
  130 INK 7: FOR f=0 TO 184 STEP 50: FOR n=0 TO 10: PLOT f,69: DRAW n,10: PLOT f+
  44,69: DRAW -n,10: NEXT n: PLOT f,69: DRAW 44,0: NEXT f
  140 FOR f=0 TO 12: PLOT 0,0: DRAW f,23: PLOT 235,0: DRAW -f,23: NEXT f
  150 INK 1: CIRCLE 20,123,13
  160 PLOT 20,123: DRAW 0,0: PLOT 20,100: DRAW -11,4: BEEP .5,0
  170 FOR f=0 TO 1: OVER 4: PLOT 20,123: DRAW -11,4: BEEP .1,-30: NEXT f
  180 FOR f=0 TO 1: OVER 4: PLOT 20,123: DRAW -9,11: BEEP .1,-25: NEXT f
  190 FOR f=0 TO 1: OVER 4: PLOT 20,123: DRAW -8,13: BEEP .1,-20: NEXT f
  200 DRAW 0: PLOT 20,123: DRAW 0,14: BEEP .05,50
  210 INK 5: CIRCLE 132,144,2
  220 CIRCLE 130,155,4
  230 CIRCLE 125,144,10
  240 LET sandra=(INT (RND*4)+6)/10: LET hazel=(INT (RND*4)+4)/10
  250 RNDSEED
  260 REM Main loop
  270 IF i=0 THEN GO SUB 5000
  280 IF RND>sandra THEN GO SUB 1000
  290 IF RND>hazel THEN GO SUB 3000
  300 IF ty>0 THEN GO SUB 2000
  310 IF PEEK 23500<letter THEN LET ty=ty+3: LET i=0
  320 LET a=a+.001: GO TO 300
  999 REM Typist 1 : Sandra :
  1000 INK 7: PAPER 0: PRINT AT 0,4:"S "IAT 10,4:" P"
  1010 BEEP .03,-30: LET p1=p1-1
  1020 PLOT 32,p1: DRAW INK 4:15,0
  1030 PRINT AT 0,4:"H":AT 10,4:"E "
  1040 BEEP .005,50
  1050 IF p1<10 THEN RETURN
  1060 GO SUB 4000
  1110 PRINT AT 21,2: PAPER 1: INK 7:"SANDRA gets the job": FOR f=10 TO 40 AT
  EP 2: BEEP .02,f-10: PAUSE 4/10: NEXT f
  1120 GO TO 4000
  9999 REM Typist 2 : you :
  10000 INK 7: PAPER 0: PRINT AT 0,15:"O "IAT 10,15:" P"
  10100 BEEP .03,-30: LET p2=p2-1

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PROGRAM

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2000 PLOT 120,0: DRAW INC 0,10,0
2000 PRINT AT 7,10: "H'PAT 10,15:"E "
2040 BEep .005,40
2050 LET ty=ty+1
2060 IF p2>15 THEN RETURN
2100 GO SUB 4000
2110 PRINT AT 31,2: PAPER 1: INC 7:"all done" Y U get the job": FOR i=1 TO 40
: BEep .01,i: PAUSE 5-4/10: BEep .01,i+20: NESt i
2120 GO TO 4000
2199 REM Typist 3 & Hsdl 3
2200 INC 7: PAPER 0: PRINT AT 7,20: "PAT 10,20:"E "
2310 BEep .03,-20: LET p3=p3+1
2320 PLOT 200,0: DRAW INC 0,10,0
2330 PRINT AT 7,20: "H'PAT 10,20:"E "
2340 BEep .005,30
2350 IF p3>15 THEN RETURN
2400 GO SUB 4000
2410 PRINT AT 31,2: PAPER 2: INC 7:"the job goes to ..... Hsdl:" FOR i=10 TO 0
0 STEP 2: BEep .03,i-10: PAUSE 4/10: NESt i
2499 REM Results of test
4000 FOR i=1 TO 500: NESt i
4010 FOR i=1 TO 100: OUT 254,i: OUT 254,100-i: NESt i
4020 BORDER 3: PAPER 3: CLS
4030 PRINT AT 0,0: PAPER 0: INC 0: "TEST RESULTS "
4040 PAPER 3: INC 0: PRINT AT 0,0: PAPER 3: "SAMPLE "INT 1000-p1esig" wor
ds per minute"
4050 PRINT AT 10,0: "p1sig" "PAT 10,10:INT 1000-p2:esig" words per m
minute"
4060 PRINT AT 14,0: "Hsdl "INT 1000-p1esig" words per minute"
4070 FOR i=0 TO 20 STEP 2: BEep .01,i: BEep .02,i+10: BEep .03,i+20: BEep .04,i+
30: NESt i
4080 PRINT AT 31,0: PAPER 0: "Press any key for another test ": PAUSE 0: GO TO 4
4999 REM Random letter
5000 LET letter=INT (RND*26)+65
5010 PRINT AT 1,10: PAPER 1: INC 1:CHng letter: LET i=i+1: RETURN
5999 REM Test over routine
6000 FOR i=0 TO 3: PRINT PAPER 7,1: "i,10:" "i: NESt i
6010 PRINT AT 0,10: PAPER 2: INC 7:" TEST OVER "
6020 FOR i=0 TO -30 STEP -3: BEep .02,i: BEep .01,i+1: BEep .005,i+2: NESt i
6030 RETURN
6999 REM Instructions
7000 LET i=0
Following your application for the job of shorthand/typist,you
are now at the interview and the Personnel manager requires you to take a typin
g test at 3 o'clock to see how good you are."
7010 CLS:PRINT " You will sit in the middle of the other 2 girls and you must
finish the test before them if you are to get the job."
7020 INC 1: PRINT: PRINT " Dear "INT 1000-1:30: PRINT
7030 FOR i=1 TO 100: LET i: PRINT i:1:1
7040 IF i=110:CHng 3: THEN BEep .02,10: BEep .01,40: PAUSE 2
7050 IF i=32 OR i=64 OR i=96 OR i=128 OR i=160 OR i=192 OR i=224 OR i=256 OR i=2
88 THEN PRINT: PRINT
7060 NESt i
7070 PAUSE 400: RETURN
8999 REM Graphs
9000 FOR g=65268 TO 65327: READ r: POKE g,r: NESt g: RETURN
9010 DATA 84,26,68,84,56,0,0,0,42,28,34,42,28,0,0,0
9020 DATA 130,0,60,3,33,16,12,3,65,0,130,199,133,6,68,192
9030 DATA 0,124,244,238,234,130,3,0,8,90,130,91,87,85,64,0
9040 DATA 0,0,0,0,124,230,240,128,0,8,0,0,62,163,95,1
9050 DATA 129,129,129,60,60,33,33,33,2,2,2,4,4,8,8,8
9060 DATA 17,17,25,28,66,90,126,66,16,16,176,200,132,180,232,130
9070 DATA 0,0,0,0,1,3,7,0,0,0,0,120,192,224,224
9080 DATA 7,15,25,15,25,15,15,31,328,240,240,240,240,240,248
9090 DATA 31,31,31,31,31,63,63,63,248,248,248,248,232,232,232
9100 DATA 63,63,127,127,127,127,28,0,232,232,234,234,234,24,0

```

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1. *Journal of the American Medical Association*, 1997; 277: 1039-1043.

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As has been stated upon numerous occasions, the graphical capabilities of the BBC micro computer are outstanding. It is therefore the aim of this article to prove to you that the multi-coloured user defined characters are frequently used by the commercial software houses are readily available to both you and me for use in our humble programs.

Before plunging in at the deep end I feel we should recap on the basis of user defined character (UDC) definitions on the BBC. The BBC's VDU command is the command used when the programmer wants to send instructions to the "VDU driver" (the part of the machine operating system responsible for the printing and manipulation of graphics on the screen).

When writing to produce UDC's we use the VDU123,0,0,0,0,0,0,0 version of the command. The identification number you have assigned to the character, followed by eight values which inform the computer of the shape to be drawn. Although this may appear to be quite a daunting task, the values required to produce a character in the shape of a man can be calculated quite simply.

Firstly draw an 8 x 8 grid on a piece of paper. Next, number the columns from right to left as shown in Fig 1. Using a pencil, shade the appropriate squares until you have produced the required shape. All that is left to do now is to label up the values of the shaded squares on each row, the value of each square being indicated at the top of its column.



Figure 1

The VDU123 statement is then constructed by typing VDU123 followed by the identification number (any number between 254 and 255) and the eight values calculated using the grid. The VDU command calculated from our diagram of the man is shown in Fig 2.

To print the character, type the following lines:

```
1 REM Program 1
```

How to create multi-coloured UDCs

In this article John Revis demonstrates how you can take full advantage of the outstanding graphic capabilities of the BBC/Electron

```
20 VDU123,254,60,35,0,0,0,0,0,0
30 PRINT CHR$(205)
40 END
```

Having RUN the program a man should have appeared in the top left hand corner of the screen. To colour the character around the program by adding the following:

```
20 COLOUR 1
```

Running the program will colour the man red. The man can be printed as various sizes by altering the value following the MODE command, but please remember that the mode selected is a graphics mode, e.g. 0,1,2,4 or 3 otherwise the character will not be printed.

As you noticed, by adding the COLOUR statement at line 20 we could print a coloured character. You have probably also noticed that the character was only one colour. To get around the limitations of the command as used so far, we must look again at the 8 x 8 grid and our eight bits.

In Fig 1 we have decided which columns are to be used in our character and divided these into sections of similar colour.

As an example we shall take the colour black as used for the hair and shoes (Fig 1). These give us the character definition: VDU123,215,60,35,0,0,0,0,0,0,0.

defined, as any character printed on the screen in the case of mode 3 this is a 28 x 32 grid. If we attempt to superimpose our four characters using the text cursor, as shown in Program 2, you will see that the only visible character after running the program is the first character printed. In this case it's the man's tootsie.

```
1 REM Program 2
20 MODE 3
30 VDU123,215,60,35,0,0,0,0,0,0,0
40 REM Hair + Shoes
50 VDU123,60,35,60,60,60,60,60,60,60
60 REM Feet + Head
70 VDU123,215,0,0,0,126,90,0,0,0,0
80 REM Shirt
90 VDU123,126,0,0,0,0,126,24,24,0,0
100 REM Trousers
110 PRINT PRINT
120 FOR N% = 10 TO 128
130 PRINT CHR$(N%),CHR$(N%)
140 NEXT N%
150 PRINT PRINT
160 END
```

Immediately following the statement which prints the character on line 40 there is the statement CHR\$(0), this is required because having printed the first character the computer automatically moves one character space to the right waiting to print the next character. CHR\$(0) is the code to move the cursor one space to the left and the next character is therefore printed directly on top of the first one.

The graphics cursor is much more flexible than the text cursor. It allows graphics to be printed anywhere on the screen using a 1280 x 1024 grid for an co-ordinates. It also allows characters to be superimposed by using the command VDU 1, the text and graphics cursors become one, everything being printed in the graphics cursor.

Having completed the two cursors you will find that you are no longer stuck at a specified point on the screen using the statement PRINT TAB(X,Y), instead, the computer now can be given specified co-ordinates before using the PRINT statement, e.g. MOVE 540,12 : PRINT man. This prints a man in the corner of the screen. By adding the following lines in program 2 you will see the effect of using the graphics cursor.

```
15 VDU 1
40 MOVE 540,12
```

Upon running the program the various parts of our man are recombined to produce a complete character and not just five trousers. Now we have the power to create a whole man



Figure 2

We now repeat the procedure for each of the other three colours giving us a total of four UDC's which should hopefully, when superimposed, produce our original character.



Figure 3

The BBC computer now has two types of cursor: text cursor and graphics cursor. So far we have been using the text cursor, which allows you to print a character, ASCII or user

from the continuous parts (the Flashmanes are your best bet). It is now only a short step to give each part a separate colour. As we are painting at the prompt screen we make use of the graphics colour statements (COL) to give colour to a printed character.

To avoid any confusion, I must explain that the statements COL, CL, (the graphics) as well as can also be written as PRINT CHR\$(15),CHR\$(5),CHR\$(1). Once the CHR\$(15) statement has been used the computer expects the next two values entered to be the mode of plotting to be used (User Guide p.325) followed by the number of the colour in which the graphics are to be printed. By using the statement before printing each character, as in Program 3, we can create a multi-coloured man.

```
1 REM Program 3
10 SCREEN 1
20 VDU 1
30 VDU123,125,60,10,0,0,0,
  0,0 REM Hair + Skin
40 VDU123,125,0,24,24,0,0,0,
  0,0 REM Face + Hands
50 VDU123,127,0,0,0,126,0,0,
  0,0 REM Suit
60 VDU123,128,0,0,0,0,24,24,
  0 REM Trousers
70 COL 0,131 CLS REM
  Colour background white
80 NEXT 128,131
90 REM Print multi-coloured
  man
100 PRINT CHR$(15),CHR$(
  5),CHR$(5),CHR$(231),
  CHR$(5),CHR$(15),CHR$(
  63),CHR$(5),CHR$(0),CHR$(
  5),CHR$(1),CHR$(1),CHR$(
  5),CHR$(1),CHR$(237),
  CHR$(5),CHR$(1),CHR$(
  5),CHR$(14),CHR$(230)
110 PRINT
120 END
```

Program 3 certainly works but it is not overly elegant. It also uses a great deal of memory (whether the ROM has to be reloaded) whenever you want to print a man during the game.

Once again the ever flexible VDU command comes to our rescue. VDU 123 is identical to PRINT CHR\$(123). Line 100 can therefore be replaced with:

```
100 VDU 15,5,125,5,15,5,
  235,5,15,5,237,5,15,5,5,
  235
```

This new version is an improvement but the whole VDU statement must still be typed whenever you wish to print a man. Program 4, however, is capable of all the code to be considered to be a string variable. In this example we named a man. The man appeared to resemble the

character as held in a DATA statement and a READ was the variable only code, at the start of the program. From this point onwards the multi-coloured character of the man can be printed at any time as the program by merely typing PRINT man.

In Program 4 is the Procedure, PROCDEFine character, called at line 90, which is responsible for assigning the data, necessary to produce the multi-coloured character of a man, to the variable man. The technique of using subroutines (User Guide p.16) is used to combine all the CHR\$(statements used in program 3 into 100 to produce one long string, man. This string, when printed, contains all the information required to carry out the colour changes and vector movements necessary to produce our multi-coloured man.

One of the major problems facing the BASIC programmer is the discontinuous rate at which animated characters show down once the number of animated characters being used is increased. By clever use of the techniques you now have at your disposal it is quite possible to print characters and give them the illusion of movement without constantly instructing the computer to re-draw the character at two different points, thereby causing the movement.

This technique, which I have always considered as being 'impossible' without computer, makes use of the BBC's flashing colours. If you, like me, have ever wondered why the BBC computer wasted one of its colours by having both flashing green-magenta and magenta-green, then wonder no more. They are the very secret of the technique.



Figure 4

Reverting once more to our little man on his 5 x 5 grid (Fig 4) even the last observer of you cannot fail to notice that he now has four arms, one pair pointing upwards, the other pointing down. This time we will colour his skin and arms to the effect to imagine. For the forward pointing upwards we will use colour 15, flashing green-magenta, for the forward pointing downwards we will use colour 13, flashing magenta-green.

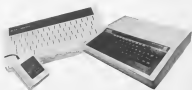
```
1 REM Program 4
10 SCREEN 1
20 VDU 1
30 VDU123,125,60,10,0,0,0,
  0,0 REM Hair and shoes
40 VDU123,125,0,24,24,0,0,0,
  0,0 REM Face two hands
50 VDU123,127,0,0,0,126,0,0,
  0,0 REM New skin definition as before
60 VDU123,128,0,0,0,0,24,24,
  0 REM Trousers
70 VDU123,129,129,129,0,0,0,
  0,0 REM Arms up
80 VDU123,129,0,0,0,126,129,
  0 REM Arms down
90 PROCDEFine character
100 man = of 15,5,125,5,15,5,
  235,5,15,5,237,5,15,5,5,
  235
110 COL 0,131 REM Colour
  background white
120 SCREEN 640,512
130 REM Print multi-coloured
```

```
man
140 PRINT man
150 PRINT PRINT
160 END
170 DEF PROCDefine charac-
  ter
180 RESTORE 340
190 of = "" REM create the
  temporary string of a copy
200 FOR n% = 0 TO 34
  REM number of rows of
  data
210 READ chr%
220 of = of + CHR$(chr%)
  REM concatenate the
  individual char into of
230 NEXT n%
240 ENDPROC
250 REM character data for
  man
260 DATA 15,5,125,5,15,5,
  1,235,5,15,5,237,5,15,5,
  5,126,5,11,5,12,236,5,15,5,
  4,235
```

Upon running program 5 you will see the vivid effect of a man with four arms, all flashing different colours. You may think at this point that the whole experiment has been a failure if you have faith for just a little longer, and replace line 80 with the following, all will be revealed.

```
80 COL 0,130 CLS REM
  Colour background green
```

Now when you RUN the program you will not that our little character waves away quite happily even though the program has stopped running. With a little imagination the technique can be used for memorable impressions, portraying the blades of a helicopter as having the wheels of a car, and all without wasting the computer's valuable time instructing it to re-draw the character, as produce the desired effect.



RAM Turbo Joystick Interface Sinclair Spectrum + £22.95

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You can't have failed to notice the full page, full colour adverts for this interface in the computer press, and you can't have failed to notice the price. It's £22.95, and that's Sinclair's own, bare-bone £2. What do you get for the same money, and in a world?

The Turbo is contained in a specially moulded case very similar to the Spectrum itself. A note, the key and there's no problem at all. It's just a case with the Spectrum's in it, and the case with some other stuff. Also included is a large set with a built-in, through which your power supply lead has to plug. What you have to do is connect the power supply to it, which is a good thing: it will prevent you from blowing your Spectrum's power supply.

The whole of the Spectrum's expansion port is exposed to the side of the Turbo, so you can connect other add-ons quite easily without having to remove the joystick port every time, which doesn't do the edge connector any good at all. There's another plus point over Interface 2, which only provides the lines for the new discontinued ZX Printer. Also the port is a ROM cartridge port with a handle, so all those strange games from Star Wars which we were promised but which have never materialised, it would seem to be a good way to give an extra language, BBC BASIC even, but it looks like you're doing it.

Just behind the ROM hatch are two standard expansion D sockets for the joystick, and that's the really clever bit. In normal use the left hand port transmits Interface 2's joystick 1, that is keys 4, 5, 6, 9, and 0 in five, while the right hand port is joystick 2, keys 1, 2, 3, 4, and 5. If, however, the Turbo detects that a game is incompatible with the Kensington protocol (the bit), then the right hand port automatically switches to this, without your having to do anything. Quite simple!

And that's not all! If your game uses the corner keys instead, then switch off your Spectrum, connect the Turbo, then, holding the fire button on your joystick down, switch it on again. Your Turbo is now configured with the corner keys. In other

Turbo joystick interface

David Martin takes a close look at RAM's new Turbo joystick interface. Read what he thinks

words, whatever protocol generated your game is designed for, the Turbo can cope. This is really very handy.

The whole thing came very neatly packed, and is accompanied by a thorough manual which (incidentally) says that the joystick is not to be used for anything other than the game.

In use, the Turbo is very straightforward. You should never need to disconnect it. I say should, because although RAM says the Turbo is completely Microdrive-compatible and also compatible

with Commodore's private interface which can be hung on the back, in practice some seem to have produced some peculiar Microdrive failures when used in conjunction with the Turbo. Power Interface 3 hoped to avoid all the mounting and disconnection problems associated with joystick interfaces with a through port. As it is, I've paid a lot of money to face exactly the same problem. In addition, some games don't seem to like the automatic switching to Kensington facility, notably Brook Biall from Micro-mega. I had to use the

Sinclair protocol, or the game crashed.

Overall then, a noble attempt to provide more facilities than appear the within the confines of one box, and that's what you pay the extra for. I would like to recommend a wholeheartedly, but, as one of the appreciable quibbles noted above, I can't. You will have to decide for yourself whether it will save all your regrettations, and whether the extra facilities it offers make the extra cost. It would be interesting to compare it with the latest offerings from all those and Kensington.

D.M.



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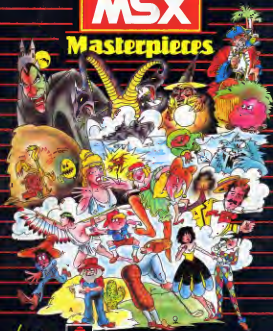
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